UNITED STATES PATENT AND TRADEMARK OFFICE

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10/622,565	07/18/2003	Abhijeet Gole	112056-0098	4816

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EXAMINER
HUSSAIN, TAUQIR

ART UNIT	PAPER NUMBER
2152	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/622,565	GOLE ET AL.
	Examiner	Art Unit	
	Tauqir Hussain	2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 July 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-32</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date <u>07/16/2007</u>.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This office action is in response to amendment /reconsideration filed on

07/27/2007, the amendment/reconsideration has been considered. Claims 24-32 are

newly added. Claims 1-32 are pending for examination, the rejection cited as stated

below.

2.   Prior objection to claim 14 have been withdrawn, as applicant argument deemed

persuasive.

Response to Argument

3.   Applicant's arguments filed on 07/27/2007 have been fully considered but they

are not deemed to be persuasive. In the remarks, applicant argued in substance that

(a)   As to claim 15, Prior art does not teach method to establish VI/QP

communication even in the absence of connection primitives normally provided

by VI/IB implementation by using <u>predefined or static addressing</u> information.

(b)   As to claim 1-2, 13-14 and 17-19, prior art does not teach "a method for

initiating a peer-to-peer communication session" and further there is no

motivation to combine Craddock with Plummer.

As to point (a), Examiner respectfully disagrees and argues that there is no

where in the claim is mention "static address" or any claim language suggest that

predefined address means static address. Examiner further, cites the paragraph [0009],

where I/O transaction is a read from a specific disk sector into a specific host memory

location meaning there is a process of address allocation before read and write

operation, even if the invention disclose the address allocation occurs dynamically

because as per dictionary definition of predefined, it means "to define beforehand". The

initiating processor (i.e., the processing node that is making the remote DMA request)

clearly would "define beforehand" to which hardware memory location and port number

(as admitted by Applicant, see page 14 of Remarks) the DMA request is destined for

prior to the actual request. Accordingly, it can be seen that the initiating processor does

in fact transmit the first remote direct memory access read operation to a "predefined

hardware address and a predefined port number", as claimed. This further elaboration

have also been added in the body of the claim rejection.

As to point (b), Examiner argues that the limitation "a method for initiating a peer-

to-peer communication session" in just a preamble and gives the notion of intended use

only and as far the motivation to combine the teachings of Craddock and Plummer is

concerned, the Supreme Court has held that "a patent for a combination which only

unites old elements with no change in their respective functions...obviously withdraws

what is already known into the field of its monopoly and diminishes resources available

to skillful men...The combination of familiar elements according to known methods is

likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co.

v. Teleflex Inc.*, 2007 U.S. LEXIS 4745, (U.S. 2007). "Common sense teaches, however,

that familiar items may have obvious uses beyond their primary purposes, and in many

cases a person of ordinary skill will be able to fit the teachings of multiple patents

together like pieces of a puzzle...the fact that a combination was obvious to try might

show that it was obvious under section 103." *KSR Int'l Co. v. Teleflex Inc.*, 2007 U.S.

LEXIS 4745, (U.S. 2007). When a patent simply arranges old elements with each

performing the same function it had been known to perform and yields no more than

one would expect from such an arrangement, the combination is obvious. *Sakraida v.*

AG Pro, Inc., 425 U.S. 273 (1976).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(e)

that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4.   Claims 15 and 16, are rejected under 35 U.S.C. 102(e) as being anticipated by

Craddock et al. (Pub. No.: US 2003/0061296 A1), hereinafter "Craddock".

5.   As to claim 15, Craddock discloses, the invention substantially, including, (a)

attempting a first remote direct memory access read operation directed to a predefined

hardware address and a predefined port number (Craddock, Fig.1, [0135, lines 1-5],

where attempt has made to read data and [0051, lines 1-13], where subnet manager is

configuring physical ports and local address, which is used for read and write operations

and Fig.1, [0009], where predefined is specific addresses for read and write defined

before the read and write operation); and

(b) performing, in response to a successful step (a), a first remote direct memory access write operation directed to the predefined hardware address and the predefined port number (Craddock, [0142, lines 1-16], where attempt has made to write data and [0051, lines 1-13], where subnet manager is configuring physical ports and local address, which is used for read and write operations).

6.　　Claim 16, is rejected for the same rationale as applied to claim 15 above.

Claim Rejections - 35 USC § 103

7.　　The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8.　　Claim 1-3, 13-14 and 17-19, are rejected under 35 U.S.C. 103(a) as being unpatentable over Craddock in view of Plummer et al. (Pub. No.: US 2005/0166185 A1), hereinafter "Plummer".

9.　　As to claim 1, Craddock discloses the invention substantially, including, a method for initiating a peer-to-peer communication session, the method comprising the steps of:

attempting a first remote direct memory access (RDMA) read operation directed to a cluster partner (Craddock, Fig.1, [0135, lines 1-5], where attempt has made to read data);

performing, in response to a successful first RDMA read operation, a first RDMA

write operation to the cluster partner (Craddock, [0142, lines 1-16], where attempt has

made to write data). Craddock does not disclose explicitly performing, in response to a

successful RDMA write operation, a second RDMA read operation directed to the

cluster partner and performing in response to a successful second RDMA read

operation, a second RDMA write operation to the cluster partner. However, Plummer

discloses, using java programming language steps can be put in loop to repeat the

steps.

Therefore, using the rationale for read and write step above it would have been

obvious to one ordinary skilled in the art at the time the invention was made to combine

the teachings of Craddock with the teaching of Plummer to use computer programming

language to have the steps looped repeatedly as it is well known in the art and in java or

basic programming language to use "go to" or "do" "recursion" loop etc. Further to

provide a computer-implemented method for substantially eliminating C recursion from

the execution of static initializer methods in a virtual machine environment includes

rewriting native C code associated with a static initializer as a Java programming

language method, and using a transition frame in a Java programming language stack

to execute the Java programming language method.

10.   As to claim 2, Craddock and Plummer discloses the invention substantially as in

parent claim 1, including, wherein the step of attempting a first RDMA read operation

further comprises the step of issuing a RDMA read operation to the cluster partner

requesting a pre-set memory address location that is associated with a status variable

on the cluster partner (Craddock, [0135, lines 1-5], where memory space is reserved for

read data and [0137, lines 1-9], where details of the pre-set memory can be observed).

11.   As to claim 3, Craddock and Plummer disclose the invention substantially as in

parent claim 1, including, exchanging a set of peer connection information (Craddock,

[0005, lines 1-4],where nodes are peer communicating with each other);

        passing a set of client information to the cluster partner (Craddock, [0077, lines

3-5]);

        creating a set of appropriate communication ports (Craddock, [0034, lines 8-9]);

        alerting the cluster partner of a ready status (Craddock, [0132, lines 1-3], where

response could be an alert message); and

        alerting a set of clients that the cluster partner is in a ready state (Craddock,

Fig.12, element-passive side, where communication management reply message is

used to accept the connection which could be a ready status).

12.   As to claim 13, is rejected for the same rationale as applied to claim 1 above and

further it is obvious that in a cluster environment if operations are distributed among

different machines, therefore it will be obvious to one ordinary skilled in the art to

distribute two operations as single operation to two machines.

13.   As to claim 14, Craddock and Plummer discloses, the invention substantially as

in parent claim 13, including, wherein the first remote direct memory access read

operation is performed over a Virtual Interface connection having a pre-determined and

pre-assigned Virtual Interface Number and a pre-determined Fiber Channel ID

(Craddock, Fig.3A, [0050, lines 1-4], where verb interface can be interpret as virtual interface and [0051, lines 1-13], where each virtual lane has its own flow control and each VL has its own ID which could be relate to virtual interface number or ID and fiber channel ID can referred to as host channel adaptor element-300).

14.   As to claim 17, Craddock and Plummer disclose, the invention substantially as in parent claim 15, including, wherein the predefined hardware address comprises a fiber channel identifier (Craddock, [0051, lines 11-13], where channel adaptor is fiber channel and configuring means it must have the reference number or MAC address could be the channel ID for configuration purposes).

15.   As to claim 18, Craddock and Plummer disclose, the invention substantially as in parent claim 15, including, wherein the predefined port number comprises a virtual interface (Craddock, [0051, lines 1-13], where VL's are virtual interface and has a unique port number assigned).

16.   As to claim 19, Craddock and Plummer disclose, the invention substantially as in parent claim 15, including, wherein the first remote direct memory access is delivered to a predefined memory address storing booting status information (Craddock, [0135, lines 1-5], where memory space is reserved for read operation and invoking can be interpret as booting).

17.   Claims 4-9, are rejected under 35 U.S.C. 103(a) as being unpatentable over

Craddock and Plummer as applied to claim 1-3 above in view of Costello et al. (Pub.

No.: US 2003/0078946 A1), hereinafter "Costello".

18.   As to claim 4, Craddock and Plummer disclose, the invention substantially as in

parent claim 3. However, Craddock and Plummer are silent on wherein the set of peer

connection information comprises a version number. Costello, however discloses,

wherein the set of peer connection information comprises a version number (Costello,

Abstract, lines 3-6, where version number is acquired by the leader node).

Therefore, it would have been obvious to one ordinary skilled in the art at the

time the invention was made to combine the teachings of Craddock and Plummer with

the teachings of Costello in order to provide a cluster of computer system nodes share

direct read/write access to storage devices via a storage area network using a cluster

system (Costello, Abstract).

19.   As to claim 5, Craddock, Plummer and Costello discloses, the invention

substantially as in the parent claim 1 above, including, collecting from a set of clients,

the set of client information (Costello, [0084, lines 1-13], where client configuration

information is collected); and

transferring the collected set of client information to the cluster partner (Costello,

[0084, lines 1-13], where server/cluster partner collects the client information).

20.   As to claim 6, Craddock, Plummer and Costello discloses, the invention

substantially as the parent claim 5, including, wherein the client information comprises a

number of communication ports required (Costello, [0083, lines 1-9], where node could be interpret as communication port).

21.   As to claim 7, Craddock, Plummer and Costello discloses, the invention substantially as the parent claim 5, including, wherein the set of client information further comprises an amount of memory requested by a particular client (Costello, [0069, lines 1-25, where each client carries a token which let him use the specific amount of memory from system memory or cache).

22.   As to claim 8, Craddock, Plummer and Costello discloses, the invention substantially as the parent claim 1, including, wherein the cluster partner is a storage system (Craddock, Fig.1, element-116, [0009, lines 1-3], where SAN is a storage system).

23.   As to claim 9, Craddock, Plummer and Costello discloses, the invention substantially as the parent claim 1, including, wherein the cluster partner is an application server (Costello, [0008, lines 1-6]).

24.   Claims 10-12 and 20-31, are rejected under 35 U.S.C. 103(a) as being unpatentable over Craddock in view of Sutherland et al. (Pub. No.: US 2002/0114341 A1), hereinafter "Sutherland".

25.   As to claim 10, Craddock discloses the invention substantially. However, Craddock is silent on a cluster connection manager adapted to initiate a peer-to-peer communication session with a cluster partner upon initialization of the storage operating

system. Sutherland, however discloses, a cluster connection manager adapted to

initiate a peer to peer communication session with a cluster partner upon initialization of

the storage operating system (Sutherland, Abstract, lines 12-16, where, storage

coordinator manager initiates and distributes the processing data among selected

nodes).

Therefore, it would have been obvious to one ordinary skilled in the art at the

time the invention was made to combine the teachings of Craddock with teachings of

Sutherland in order to provide a peer-to-peer storage system includes a storage

coordinator that centrally manages distributed storage resources in accordance with

system policies administered through a central administrative console.

26.   Claims 20, 24, 27-28 and 31, are rejected for the same rationale as applied to

claim 10 above.

27.   As to claim 11, Craddock and Sutherland discloses, the invention substantially as

in parent claim 10, including, means for performing a remote first direct memory access

(RDMA) read operation directed to a cluster partner (Craddock, Fig.1, [0135, lines 1-5],

where device 1429 is a mean to perform read function);

means for performing, in response to a successful first RDMA read operation, a

first RDMA write operation to the cluster partner (Craddock, [0142, lines 1-16], where

element 1432 is a mean for performing writing function). Using the rationale for read

and write step it would have been obvious to one ordinary skilled in the art at the time

the invention was made to modify the teachings or Craddock to repeat the steps more

than one time in order to provide a distributed data processing system for processing

storage I/O in a system area network. In addition the process can be used in a peer-to-

peer storage system uses a storage coordinator that centrally manages distributed

storage resources in accordance with system policies administered through a central

administrative console.

28.   As to claim 12, Craddock and Sutherland discloses, the invention substantially as

in parent claim 10, including, means for exchanging a set of peer connection information

([0004, lines 1-4]);

        means for passing a set of client information to the cluster partner (Craddock,

[0077, lines 3-5]);

        means for creating a set of appropriate communication ports (Craddock, [0034,

lines 8-9];

        means for alerting the cluster partner of a ready status (Craddock, [0132, lines 1-

3], where response could be an alert message); and

        means for alerting a set of clients that the cluster partner is in a ready state

(Craddock, Fig.12, element-passive side, where communication management reply

message is used to accept the connection which could be a ready status).

29.   As to claim 21, Craddock and Sutherland discloses, the invention substantially as

in parent claim 20, including, wherein the reliable peer-to-peer connection is established

without requiring a storage operating system executing on each storage system partner

to be fully functioning (Sutherland, Abstract, lines 17-20], where in operations are not

interrupted if any of the cluster storage coordinators should fail).

30.   As to claims 22, 25 and 29, Craddock and Sutherland discloses, the invention

substantially as in parent claims 20, 24 and 28, including, wherein the peer-to-peer

connection is a virtual interface connection (Craddock, Fig.3A, [0050, lines 1-4], where

verb interface is virtual interface)

31.   As to claims 23, 26 and 30, Craddock and Sutherland discloses, the invention

substantially as in parent claims 20, 24 and 28, including, wherein the peer process is a

cluster connection client that requests services from the cluster connection manager

(Sutherland, Abstract, lines 14-47,where users requesting for files are clients).

32.   Claim 32 is rejected under 35 U.S.C 103(a) as being unpatentable over

Craddock in view of what was well known in the art.

33.   As to claim 32, Craddock discloses the invention substantially, including, wherein

information comprises signal (Craddock, [0154], where signal is use to ensure all work

completed successfully which is an information). Craddock however is silent on using

heartbeat signal.

Official Notice (see MPEP ' 2144.03 Reliance on "Well Known" Prior Art) is taken

that was well known in the art to get the advantage of having alert or warning system in

place in parallel processing or cluster processing by using by using heartbeat signals

e.g. processors status or job completed or request for another job. Examiner Further

cites, heartbeat signals can also be use for newly added device detection in a parallel processing, Cluster environment and SAN system.

Examiner's Note: Examiner has cited particular columns and line numbers in the references, as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in its entirety as potentially teaching of all or part of the claimed invention, as well as the context.

Conclusion

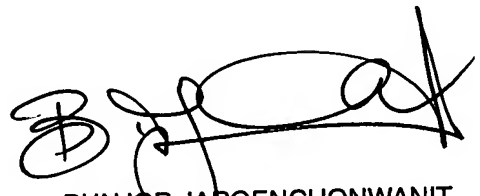**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tauqir Hussain whose telephone number is 571-270-1247. The examiner can normally be reached on 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571 272 3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TH

BUNJOB JAROENCHONWANIT
SUPERVISORY PATENT EXAMINER

10/10/7